Space Weather Forecast

Issued on Tuesday, 07 May 2024 at 12:18 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Occasional Moderate flares expected with chance of isolated Strong flares. Chance of Minor geomagnetic storm intervals due to Coronal Mass Ejections (CMEs).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is High. A large and complex sunspot region in the northwest has continued to produce numerous moderate flares in the last 24 hours. A second, now larger region in the south-centre disc is less active, but has rapidly developed with a complex magnetic configuration. These two groups are part of nine sunspot regions on the visible disc. The remaining sunspots on the disc are smaller, stable and magnetically simple.

A Coronal Mass Ejection (CME) appears to have occurred, starting around 07/0000 UTC from a region close to the sunspot group in the south-centre disc. Analysis is ongoing to determine if there is an Earth-directed component to it.

Solar Wind / Geomagnetic Activity: Solar winds were predominantly at slightly elevated to elevated levels resulting from the connection one or more coronal holes. Speeds peaked briefly at strong levels (602km/s at 07/0150 UTC). The Interplanetary Magnetic Field remained mainly at moderate levels initially before declining to weak levels around 06/1730 UTC. The important north-south component was very variable but declined from moderate levels to become weak. Geomagnetic activity was Quiet to Active (Kp 1-4).

Energetic Particles / Solar Radiation: Solar radiation was at normal background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate to High solar activity is forecast to continue with occasional Moderate flares expected and a chance of isolated Strong flares, principally from the large sunspot regions located in the northwest and south-centre parts of the visible disc.

Solar Wind / Geomagnetic Activity: There are multiple potential Earth-directed CMEs in the forecast period, although confidence is low due to a lack of solar imagery in recent days. Of these, the majority, if not all are expected to pass above or below Earth orbit, most likely limiting any impacts to glancing blows. Earth is under the influence of a HSS (High speed stream) from a couple of coronal holes and expected to peak at elevated levels on Day 1 (07 May) before slowly declining between Days 2-4 (08-10 May) towards slightly elevated or background levels.

Geomagnetic activity should generally fall between Quiet to Active levels through the period, but with a chance of Minor Storm (Kp5) intervals on all days, given the potential for peripheral CME enhancements.

Energetic Particles / Solar Radiation: Solar radiation levels is most likely to remain at background levels through the period. There is a slight chance for an S1/Minor Storm or greater event occurring throughout however, primarily from the large, complex sunspot region in the northwest disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	20	20	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	95	95	90	90
Very Active	R3 to R5 X	No	45	45	40	40

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	25	25	30	30
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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